Food Spoilage and Safety Predictor (FSSP) Software

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Mathematical models for growth, survival or inactivation of microorganisms can be valuable tools to evaluate safety and shelf-life of food. However, such predictive microbiology models can be difficult to use in practice unless they are included in user-friendly application software such as Food Spoilage and Safety Predictor (FSSP) [1]. This software contains various models to predict the effect of product characteristics and storage conditions on shelf-life and safety of food. The first version of the software was launched as far back as in January 1999 and it is now widely used in 118 countries.

In 2014 a new and expanded version of the FSSP software is launched. FSSP contains new predictive models and new facilities in addition to all the features already available as part of the former version called Seafood Spoilage and Safety Predictor (SSSP), e.g. models to predict the effect of temperature storage conditions on product shelf-life, models for growth of specific spoilage micro-organisms to predict shelf-life of fresh fish and models to predict food safety including histamine formation in marine fin-fish. New predictive models in FSSP include:

- Growth and growth boundary model for lactic acid bacteria in meat and seafood products. This new model has been extensively validated and it can be used for a wide range of products [2].
- Expanded model to predict the simultaneous growth of lactic acid bacteria and *Listeria monocytogenes* in various meat and seafood products including some mayonnaise based seafood salads.
- Product specific models for the simultaneous growth of lactic acid bacteria and *Listeria monocytogenes* in chilled cottage cheese.
- A generic growth and growth boundary model for any microorganism/food combination where cardinal growth parameter values like the minimum temperature and pH for growth have been determined. This generic model can take into account the effect of various product characteristics and storage conditions. Predictions can be obtained for constant or for dynamic temperatures, pH and lactic acid conditions.

FSSP can for example be used to document if *Listeria monocytogenes* is able or unable to grow in a product [3]. This specific use of the software is described on the Danish Veterinary and Food Administration website (www.fvst.dk, in Danish). In addition, FSSP can be used to facilitate development or reformulation of especially lightly preserved foods.

FSSP is an important tool for the public sector consultancy, teaching and industry advice given by the Predictive Microbiology research group at the National Food Institute, Technical University of Denmark.

FSSP is available for free at http://fssp.food.dtu.dk. To help interested FSSP users benefit from this tool, one-day workshops are organized as indicated on the FSSP-homepage or on request to the author.

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